WHAT IS CLAIMED IS:

1.   A   real-time   picture   information compression-transmission   apparatus   for compression-transmitting picture information in a real time manner, comprising:

input means for receiving said picture information;

an encoder encoding said picture information from the input means on a preset cycle in a real time manner;

storage   means   for   writing   and   storing real-time-encoded frame data on said picture information from the encoder for each frame;

division   means   for   sequentially   dividing said real-time-encoded frame data stored in the storage means into packets for each frame; and

transmission timing control and transmission means for controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and for transmitting the packets to the network according to a connection-less type protocol.

2.   A   real-time   picture   information compression-transmission apparatus according to claim 1, wherein

the division means for dividing each frame data into the packets, divides each of said encoded frame data into

the packets in size suited for an Ethernet maximum transfer

unit; and

the transmission timing for transmitting the divided

packets to the network is determined from an encoded frame

5   interval and a frame data storage time.

3.   A   real-time   picture   information

compression-transmission apparatus according to claim 1,

10   wherein

the division means for dividing each frame data into

the packets is constituted so that:

a payload size of a transmitted UDP packet corresponds

to a value obtained by subtracting an IP header size and

15   a UDP header size from an Ethernet maximum transfer unit;

and

the number of UDP packets divided from a K-th frame

corresponds to a value obtained by dividing a data size,

in bytes, of the K-th frame by the payload size, in bytes,

20   of the transmitted UDP packet; and

the transmission timing, controlled by said control

means, for transmitting the packets to the network is set

so that a transmission time, in seconds, for transmitting

the K-th frame data to the network corresponds to a value

25   obtained by subtracting a write time, in seconds, for which

said encoder writes the K-th frame data into said storage

means, from a frame interval, in seconds, between the K-th

frame data and a (K + 1)th frame data.

4.   A   real-time   picture   information
compression-transmission apparatus according to claim 1,
wherein

if multi-channel transmission is conducted, the
transmitted packets are further filtered using one of UDP
port numbers and IP multi-cast addresses, whereby even if
a network band in which the packets are being transmitted
is   narrowed,   filtered   picture   information   can   be
transmitted.

5.   A   real-time   picture   information
compression-transmission apparatus according to claim 2,
wherein

if multi-channel transmission is conducted, the
transmitted packets are further filtered using one of UDP
port numbers and IP multi-cast addresses, whereby even if
a network band in which the packets are being transmitted
is   narrowed,   filtered   picture   information   can   be
transmitted.

6.   A   real-time   picture   information
compression-transmission apparatus according to claim 3,

wherein

if multi-channel transmission is conducted, the transmitted packets are further filtered using one of UDP port numbers and IP multi-cast addresses, whereby even if a network band in which the packets are being transmitted is narrowed, filtered picture information can be transmitted.

7. A real-time picture information compression-transmission apparatus for compression-transmitting live picture information in a real time manner, comprising:

input means for receiving said live picture information;

an encoder encoding said live picture information from the input means on a preset cycle in a real time manner;

storage means for writing and storing real-time-encoded frame data on said picture information from the encoder for each frame;

division means for sequentially dividing said real-time-encoded frame data stored in the storage means into packets for each frame;

transmission timing control and transmission means for controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing

next frame data, and for transmitting the packets to the network according to a connection-less type protocol;

packet loss detection means for detecting packet loss of the packets transmitted to the network; and

encoding bit rate control means for controlling an encoding bit rate of said encoder by the detected packet loss.

8. A real-time picture information compression-transmission apparatus according to claim 7, wherein

the packet loss detection means detects said packet loss by searching an order of serial numbers in the packets;

the encoding bit rate control means controls said encoder to reduce said encoding bit rate if a packet loss value exceeds a threshold.

9. A real-time picture information compression-transmission apparatus according to claim 7, wherein

each of the serial numbers in said packets is inserted after a packet header and into a top of user packet data.

10. A real-time picture information

compression-transmission apparatus for compression-transmitting picture information on a plurality of channels in a real time manner, comprising:

a plurality of sets of input means for receiving said picture information;

a plurality of sets of encoders encoding said picture information from the input means on a preset cycle in a real time manner;

a plurality of sets of storage means for writing and storing real-time encoded frame data on said picture information from the encoder for each frame;

a plurality of sets of division means for sequentially dividing said real-time encoded frame data stored in the storage means into packets for each frame;

a plurality of sets of transmission timing control and transmission means for controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and for transmitting the packets to the network according to a connection-less type protocol, wherein

the plurality of sets of input means, encoders, storage means, division means and transmission timing control and transmission means are prepared to correspond to the picture information on the plurality of channels, respectively, so as to process live picture information on said plurality of channels;

packet loss detection means for detecting packet loss of the packets transmitted to the network; and

transmission timing control and adjustment means for adjusting and controlling said transmission timing

5 controlled and transmitted by said plurality of sets of transmission timing control and transmission means, respectively.

10 11. A real-time picture information compression-transmission apparatus according to claim 10, wherein

the adjustment and control of said transmission timing is carried out so as to minimize a sum of packet loss rates

15 of the respective channels.

12. A real-time picture information compression-transmission apparatus according to claim 10,

20 wherein

the adjustment and control of said transmission timing is carried out by setting same or different packet transmission start offset for each channel, the packet transmission start offset conducted to be changed in frame

25 units.

13. A real-time picture information compression-transmission apparatus according to claim 11, wherein

the adjustment and control of said transmission timing is carried out so that a J channel packet transmission delay corresponds to a value obtained by dividing an eightfold value of a product between the Ethernet maximum transfer unit and a J channel timing fine adjustment parameter SJ, where $1 \leqq J \leqq N$, and N is the number of channels, by an effective network band in bit/sec, and so that an upper limit of packet transmission timing fine adjustment parameters SJ, where SJ includes S1, S2, S3, $\cdots$, SN, N is total channel number, and $1 \leqq J \leqq N$, corresponds to a value obtained by dividing an average packet transmission interval per channel by a time required to transmit the Ethernet maximum transfer unit.

14. A real-time picture information compression-transmission method for compression-transmitting picture information in a real time manner, comprising:

an encoding step of encoding said picture information on a preset cycle in a real time manner;

a storage step of writing and storing real-time-encoded frame data on said picture information for each frame;

a division step of sequentially dividing said

real-time-encoded frame data into packets for each frame; and

a transmission timing control and transmission step of controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and of transmitting the packets to the network according to a connection-less type protocol.

15. A real-time picture information compression-transmission method for compression-transmitting live picture information in a real time manner, comprising:

an encoding step of encoding said live picture information on a preset cycle in a real time manner;

a storage step of writing and storing real-time-encoded frame data on said picture information for each frame;

a division step of sequentially dividing said real-time-encoded frame data into packets for each frame;

a transmission timing control and transmission step of controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and of transmitting the packets to the network according to a connection-less type protocol;

a packet loss detection step of detecting packet loss

of the packets transmitted to the network; and

an encoding bit rate control step of controlling an encoding bit rate in said encoding step by the detected packet loss.

16. A real-time picture information compression-transmission method for compression-transmitting picture information on a plurality of channels in a real time manner, comprising:

an encoding step of encoding said picture information on a preset cycle in a real time manner;

a storage step of writing and storing real-time encoded frame data on said picture information for each frame;

a division step of sequentially dividing said real-time encoded frame data into packets for each frame;

a transmission timing control and transmission step of controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and of transmitting the packets to the network according to a connection-less type protocol;

a packet loss detection step of detecting packet loss of the packets transmitted to the network; and

a transmission timing control and adjustment step of adjusting and controlling said transmission timing in said transmission timing control and transmission step for said

each channel by the detected packet loss.

17. A storage medium stored a control program for allowing a computer to control compression-transmitting picture information in a real time manner, the control program allowing the computer to control:

encoding said picture information on a preset cycle in a real time manner;

writing and storing real-time-encoded frame data on said picture information for each frame;

sequentially dividing said real-time-encoded frame data into packets for each frame; and

controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and transmitting the packets to the network according to a connection-less type protocol.

18. A storage medium stored a control program for allowing a computer to control compression-transmitting live picture information in a real time manner, the control program allowing the computer to control:

encoding said live picture information on a preset cycle in a real time manner;

writing and storing real-time-encoded frame data on said picture information for each frame;

sequentially dividing said real-time-encoded frame data into packets for each frame;

5   controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and transmitting the packets to the network according to a connection-less type

10   protocol;

detecting packet loss of the packets transmitted to the network; and

controlling an encoding bit rate in said encoding by the detected packet loss.

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19. A storage medium stored a control program for allowing a computer to control compression-transmitting live picture information on a plurality of channels in a

20   real time manner, the control program allowing the computer to control, with respect to the live picture information on the plurality of channels, for each channel:

encoding said picture information on a preset cycle in a real time manner;

25   writing and storing real-time encoded frame data on said picture information for each frame;

sequentially dividing said real-time encoded frame

data into packets for each frame;

controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and transmitting the packets to the network according to a connection-less type protocol;

detecting packet loss of the packets transmitted to the network; and

adjusting control of said transmission timing for said each channel by the detected packet loss.

20. A picture information decoding apparatus for decoding compressed video data using motion compensation prediction and discrete cosine transform, comprising:

means for converting an inversely-quantized discrete cosine transform coefficient into a smaller base than an encoding-side discrete cosine transform base;

means for performing inverse transform using inverse discrete cosine transform using the smaller base than the encoding-side discrete cosine transform base; and

means for converting picture data subjected to the inverse discrete cosine transform into picture data having a same size as a size of the compressed video data.

21. A picture information decoding apparatus according to claim 20, wherein

the picture information decoding apparatus decodes only intra coded pictures.

22. A picture information decoding apparatus according to claim 20, further comprising:

means for conducting motion compensation prediction to block data having a same size as a size of encoded block data, and for restoring picture block data inversely discrete cosine transformed to have the same block size as the size of said encoded block data, into the video data; and

means for storing the restored video data for said motion compensation prediction.

23. A picture information decoding apparatus according to claim 22, wherein

the picture information decoding apparatus decodes only intra coded pictures and one-way predictive encoded pictures.

24. A picture information decoding apparatus according to claim 22, wherein

the picture information decoding apparatus further

comprises means, connected to means for performing inverse transform using inverse discrete cosine transform using the smaller base than said encoding-side discrete cosine transform base through switching means, for conducting

5 inverse discrete cosine transform with a same block size as a block size of said compressed video data;

the intra coded pictures are decoded by the means for conducting inverse discrete cosine transform to the block data of the same block size as the size of said encoded block

10 data; and

encoded pictures other than the intra coded pictures are subjected to an inverse transform processing using the inverse discrete cosine transform having the smaller base than the encoding-side discrete cosine transform base, and

15 decoded by conducting said motion compensation prediction.

25. A picture information decoding apparatus according to claim 20, wherein

20 said means for converting said inversely-quantized discrete cosine transform coefficient into the smaller base than the encoding-side discrete cosine transform base is scaling means.

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26. A picture information decoding apparatus for decoding compressed video data using motion compensation

prediction and discrete cosine transform, comprising:

means for low-pass filtering an inversely quantized discrete cosine transform coefficient; and

means for inversely transforming the low-pass filtered data using an inverse discrete cosine transform having a base of a same size as a size of an encoding-side discrete cosine transform base, wherein

the inverse discrete cosine transform is to inversely transform a non-zero discrete cosine transform coefficient.

27. A picture information decoding apparatus according to claim 26, wherein

the picture information decoding apparatus decodes only intra coded pictures.

28. A picture information decoding apparatus according to claim 27, further comprising:

means for conducting motion compensation prediction to block data having a same size as a size of encoded block data, and for restoring the video data; and

means for storing the restored video data for said motion compensation prediction.

29. A picture information decoding apparatus

according to claim 28, wherein

the picture information decoding apparatus decodes only intra coded pictures and one-way predictive encoded pictures.

30.   A picture information decoding apparatus according to claim 28, wherein

the picture information decoding apparatus further comprises means, connected to means for inversely transform said low-pass filtered data using inverse discrete cosine transform having a base of a same size as a size of an encoding-side discrete cosine transform base through switching means, for conducting discrete cosine transform to the data of a same block size as a block size of the compressed video data;

the intra coded pictures are decoded by the means for conducting discrete cosine transform to the data of the same block size as the block size of said compressed video data; and

encoded pictures other than the intra coded pictures are decoded by inversely transforming said low-pass filtered data using the inverse discrete cosine transform having the base of the same size as the size of the encoding-side discrete cosine transform base, and by conducting said motion compensation prediction.

31. A computer readable storage medium stored a program for allowing a computer to execute:

a step of converting an inversely-quantized discrete cosine transform coefficient into a smaller base than an encoding-side discrete cosine transform base;

a step of performing inverse transform using inverse discrete cosine transform having the smaller base than the encoding-side discrete cosine transform base; and

a step of converting picture data subjected to the inverse discrete cosine transform into picture data having a same size as a size of the compressed video data.

32. A computer readable storage medium stored a program for allowing a computer to execute:

a step of low-pass filtering an inversely-quantized discrete cosine transform coefficient; and

a step of inversely transforming the low-pass filtered data using a base of a same size as a size of an encoding-side discrete cosine transform base.

33. A computer readable storage medium according to claim 31, wherein

the storage medium further stores a program for a step of conducting motion compensation prediction to block data

having a same size as a size of encoded block data, and of

restoring a video data.